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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/024,883	12/17/2001	Hiroyuki Okuyama	112857-307	6182

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EXAMINER

BREWSTER, WILLIAM M

ART UNIT	PAPER NUMBER
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2823

DATE MAILED: 12/17/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/024,883

Applicant(s)

OKUYAMA ET AL.

Examiner

William M. Brewster

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 12 November 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-37 is/are pending in the application.
- 4a) Of the above claim(s) 30-37 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-29 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Election/Restrictions

Claims 30-37 are withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to a nonelected invention, there being no allowable generic or linking claim. Applicant timely traversed the restriction (election) requirement in Paper No. 6.

Applicant's election without traverse of claims 1-29 in Paper No. 6 is acknowledged.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claim 1 is rejected under 35 U.S.C. 102(b) as being anticipated by Nunoue et al., U.S. Patent No. 5,905,275.

Nunoue anticipates a semiconductor light emitting device comprising:
In fig. 1D, a substrate 11 having a surface that has a difference-in-height portion wherein the difference-in-height portion and the crystal portion comprises a shape selected from the group consisting, of a stripe shape, a rectangular shape, a round shape, a triangular shape, a hexagonal shape and combinations thereof: in fig. 4, a

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stripe shape, forming a valley having a cross-section that is substantially V-shaped by incline 11b in fig. 1A; wherein the crystal growth layer, GaN, 13, col. 4, line 60 - col. 5, line 8, further comprises a portion which is substantially parallel with respect to a principal plane along which at least a portion of the substrate is oriented; a crystal growth layer formed on the surface of the substrate wherein at least a portion of the crystal growth layer is oriented along an inclined plane with respect to the surface of the substrate; and a first conductive layer (other layers in the inclusive label of 13), an active layer (other layers in the inclusive label of 13) and a second conductive layer, an electrode 16, col. 5, lines 30 - 54, formed on the crystal growth layer in a stacked arrangement and oriented along the inclined plane, wherein the semiconductor light emitting device comprises a light emitting diode structure and a semiconductor laser structure, col. 4, lines 34 - 37.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 2-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nunoue as applied to claim 1 above, and further in view of Horino et al., U.S. Patent No. 6,072,197.

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Nunoue does not specify the substrate comprises a wurtzite compound, but Horino does. Horino teaches a semiconductor light emitting device comprising: in fig. 5A, a substrate 34 comprising a substrate layer composed of a wurtzite compound, col. 1, lines 39 - 49, formed along a principal plane of the substrate wherein the layer includes a different in-height portion formed in a surface of the substrate layer; a crystal growth layer 12 formed on the surface of the wurtzite compound substrate layer at least a portion of the crystal growth layer is oriented along an inclined plane that is inclined with respect to the principal plane, wherein the crystal growth layer is grown at a temperature of about 1100° C or less, col. 16, lines 24 - 43, although no pressure is mentioned, it is reasonable that the flow rates of 2-100 $\mu\text{mol/min}$. would encompass about 100 Torr or more, wherein the surface of the substrate is oriented along a C-plane such that an end portion of the different-in-height portion is oriented perpendicular with respect to at least one of a $\langle 1-100 \rangle$ direction and a $\langle 11-20 \rangle$ direction and wherein the growth of the crystal growth layer depends on a shape of the difference-in-height portion, and wherein the inclined plane comprises at least one of a S-plane and a $\{11-22\}$ plane (facet is not limited to a $\{11\ 21\}$ facet in this case) col. 15, lines 30-49; a first conductive cladding layer 12, an active layer 14 and a second conductive layer 15 formed on the crystal growth layer in a sequentially stacked arrangement oriented along two or more planes of the crystal growth layer, including the inclined plane such that one or more light emission regions are formed; and one or more electrodes separately formed in the light emission regions, col. 15, lines 12 - 57, wherein at least one of a composition and a thickness of the active layer varies with respect to the light emission

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regions such that the wavelengths are different from each other, col. 20, line 63 - col. 21, line 27, wherein the light emitting device has a light emitting diode structure allowing simultaneous emission of light associated with two or more colors. Horino gives motivation in col. 5, lines 12-33. It would have been obvious to a person of ordinary skill in the art at the time the invention was made to recognize that combining Horino's process with Nunoue's invention would have been beneficial because it forms triaxial anisotropy in the active layer reducing the threshold current necessary for the oscillation.

The following does not represent new information, but is presented to satisfy the §103(a) requirement.

Claims 17-29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Horino in view of Nunoue.

Nunoue anticipates a semiconductor light emitting device comprising:
In fig. 1D, a substrate 11 having a surface that has a difference-in-height portion wherein the difference-in-height portion and the crystal portion comprises a shape selected from the group consisting, of a stripe shape, a rectangular shape, a round shape, a triangular shape, a hexagonal shape and combinations thereof; in fig. 4, a stripe shape, forming a valley having a cross-section that is substantially V-shaped by incline 11b in fig. 1A; wherein the crystal growth layer, GaN, 13, col. 4, line 60 - col. 5, line 8, further comprises a portion which is substantially parallel with respect to a principal plane along which at least a portion of the substrate is oriented; a crystal

growth layer formed on the surface of the substrate wherein at least a portion of the crystal growth layer is oriented along an inclined plane with respect to the surface of the substrate; and a first conductive layer (other layers in the inclusive label of 13), an active layer (other layers in the inclusive label of 13) and a second conductive layer, an electrode 16, col. 5, lines 30 - 54, formed on the crystal growth layer in a stacked arrangement and oriented along the inclined plane, wherein the semiconductor light emitting device comprises a light emitting diode structure and a semiconductor laser structure, col. 4, lines 34 - 37.

Nunoue does not specify the substrate comprises a wurtzite compound, but Horino does. Horino teaches a semiconductor light emitting device comprising: in fig. 5A, a substrate 34 comprising a substrate layer composed of a wurtzite compound, col. 1, lines 39 - 49, formed along a principal plane of the substrate wherein the layer includes a different in-height portion formed in a surface of the substrate layer; a crystal growth layer 12 formed on the surface of the wurtzite compound substrate layer at least a portion of the crystal growth layer is oriented along an inclined plane that is inclined with respect to the principal plane, wherein the crystal growth layer is grown at a temperature of about 1100° C or less, col. 16, lines 24 - 43, although no pressure is mentioned, it is reasonable that the flow rates of 2-100 $\mu\text{mol}/\text{min}$. would encompass about 100 Torr or more, wherein the surface of the substrate is oriented along a C-plane such that an end portion of the different-in-height portion is oriented perpendicular with respect to at least one of a $\langle 1-100 \rangle$ direction and a $\langle 11-20 \rangle$ direction and wherein the growth of the crystal growth layer depends on a shape of the difference-in-height


portion, and wherein the inclined plane comprises at least one of a S-plane and a {11-22} plane (facet is not limited to a {11 21} facet in this case) col. 15, lines 30-49; a first conductive cladding layer 12, an active layer 14 and a second conductive layer 15 formed on the crystal growth layer in a sequentially stacked arrangement oriented along two or more planes of the crystal growth layer, including the inclined plane such that one or more light emission regions are formed; and one or more electrodes separately formed in the light emission regions, col. 15, lines 12 - 57, wherein at least one of a composition and a thickness of the active layer varies with respect to the light emission regions such that the wavelengths are different from each other, col. 20, line 63 - col. 21, line 27, wherein the light emitting device has a light emitting diode structure allowing simultaneous emission of light associated with two or more colors. Horino gives motivation in col. 5, lines 12-33. It would have been obvious to a person of ordinary skill in the art at the time the invention was made to recognize that combining Horino's process with Nunoue's invention would have been beneficial because it forms triaxial anisotropy in the active layer reducing the threshold current necessary for the oscillation.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to William M. Brewster whose telephone number is 703-305-5906. The examiner can normally be reached on Full Time.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Olik Chaudhuri can be reached on 703-306-2794. The fax phone numbers for the organization where this application or proceeding is assigned are 703-305-3432 for regular communications and 703-305-3432 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

WB
December 6, 2002


Olik Chaudhuri
Supervisory Patent Examiner
Technology Center 2800